

# Rocky Mountain Arsenal

## Proposed National Priorities List Partial Deletion of the Internal Parcel

April 2006

### THE DELETION PROCESS

The process for the Internal Parcel deletion from the Rocky Mountain Arsenal NPL Site includes a public meeting:

**Tuesday, May 9, 2006  
5:30-8:30 p.m.  
at the  
Doubletree Hotel,  
3203 Quebec St.  
Denver, CO 80000**

The process also includes a 30-day public comment period beginning April 26, 2006 through May 25, 2006.

Upon completion of the public comment period, EPA, in consultation with the State of Colorado and the U.S. Army, will evaluate each significant comment and any significant new data received and prepare a responsiveness summary, which will be available to the public. After this review and evaluation of comments and data, any final decision to proceed with partial deletion will conclude with publication of a notice of the partial deletion in the *Federal Register* and a local newspaper.



Workers complete gradefill to restore the natural contours of soil areas excavated as part of remediation activities at the Rocky Mountain Arsenal. After gradefilling is complete, the site is revegetated with native plants.

### Introduction

The Environmental Protection Agency (EPA) Region 8, with the concurrence of the State of Colorado through the Colorado Department of Public Health and Environment (CDPHE), is proposing to delete a portion of the Rocky Mountain Arsenal (RMA) site known as the Internal Parcel from the National Priorities List (NPL). The RMA is located in Adams County, Colorado. The NPL is a national list of environmental sites prioritized for cleanup by the EPA based on potential risk to human health and the environment.

In accordance with the criteria established in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR 300, sites may be deleted from the NPL where no further response is necessary to protect public health or the environment. As described in 40 CFR 300.425(e)(3), portions of a site deleted from the NPL remain eligible for further remedial actions if warranted by future conditions.



## Remedial Actions Performed in the Internal Parcel

EPA, with the concurrence of the State of Colorado, has approved all remedial actions in the Internal Parcel based on their completion in accordance with the ROD requirements and final designs for protection of human health and the envi-

ronment. These actions have resulted in the removal of hazardous substances to a level that allows future use as a national wildlife refuge. In the Internal Parcel areas east of E Street (3,111 acres), surface media, structures, and groundwater media

are included in the proposed deletion. Groundwater below RMA west of E Street remains contaminated above action levels; consequently only surface media and structures are proposed for deletion in these areas (4,288 acres).

### Surface Media

The selected remedy for surface media, as detailed in the ROD, has been completed in the Internal Parcel. Remediation included the excavation of soil and materials presenting a risk to human health and disposal in the On-Post Hazardous Waste Landfill (HWL); and excavation of debris and soil presenting a risk to biota and disposal in the Basin A Consolidation Area. The excavated areas were backfilled with on-post borrow material -- soils from other designated areas on the RMA -- and revegetated. The ROD, Refuge Act, and Federal Facilities Agreement (which formalized the process framework for selection and implementation of cleanup remedies at the RMA) restrict use of the Internal Parcel for residential or agricultural purposes, and for hunting or fishing for consumptive purposes.

Per the ROD, areas with similar contamination were combined, resulting in twelve cleanup projects for surface media. These completed projects within the Internal Parcel include:

8 The Burial Trenches Soil Remediation (Parts I and II) project was completed in 2004. A total of 87,790 bank cubic yards (bcy) of contaminated soil posing a risk to human health (Human Health Exceedence Soil, or HHE), muni-

tions debris, red ash from mustard demilitarization, and asbestos-containing material was excavated from 31 remedy sites and disposed in the on-site hazardous waste landfill. Another 2,119 bcy of material with lesser degrees of contamination (biota-risk soil) were disposed in the Basin A consolidation area.

8 The CAMU Soil Remediation project was completed in 1998. Approximately 278,532 bcy of biota risk soils were excavated to a depth of one foot and disposed in Basin A.

8 The Existing (Sanitary) Landfills Remediation project was completed in 2005. A total of 148,487 bcy of HHE soil, munitions debris, polychlorinated biphenyl (PCB)-contaminated equipment, and asbestos-containing material was excavated from two remedy sites and disposed in the hazardous waste landfill. Another 1,875 bcy

of biota-risk soil were used as cover for the asbestos-containing material in the landfill. Approximately 14,826 bcy of biota risk soils and debris were excavated and disposed in Basin A.

8 The Lake Sediments Soil Remediation project was completed in 2000. A total of 30,690 bcy of HHE soil, debris, and mercury-contaminated biota-risk soils was excavated from two remedy sites and disposed in the HWL. Another 2,372 bcy of biota-risk soil were disposed in Basin A.

8 The Miscellaneous Northern Tier Soil Remediation project was completed in 2000. A total of 19,400 bcy of HHE soil, debris, and asbestos-containing material was excavated from three remedy sites and disposed in the hazardous waste landfill. Another 35,365 bcy of biota risk soil and debris were disposed in Basin A.



Core drilling for soil testing.

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## Remedial Actions Performed in the Internal Parcel

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### Surface Media *Continued from page 3*

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8 The Miscellaneous Southern Tier Soil Remediation project was completed in 2000. A total of 17,676 bcy of HHE soil, asbestos, and lower concentrations of lead was excavated from 4 remedy sites and disposed in the hazardous waste landfill. Another 20,008 bcy of biota-risk soil and debris were disposed in Basin A. In addition, 5,919 bcy of biota-risk soil was used to backfill an HHE soil excavation and was covered with 2 feet of clean soil.

8 The Munitions Testing Soil Remediation (Part I) project was completed in 2002. A total of 10,100 bcy of munitions debris was excavated from 2 remedy sites and disposed in the HWL.

8 The North Plants Structures Demolition and Removal project was completed in 2004. As part of the project, HHE and biota-risk soil; structures where the nerve agent GB, also called sarin, was manufactured; and approximately 800 feet of an 18-inch concrete sewer pipe within the Parcel were



Soil sampling

excavated and disposed in the HWL.

8 The Sanitary and Chemical Sewer Plugging (Phase I) project was completed in 1998. This project plugged 18 sanitary sewer manholes with grout.

8 The Section 35 Soil Remediation project was completed in 2003. A total of 4,375 bcy of HHE soil, chemical sewers, and associated debris was excavated from 7 remedy sites and disposed in the HWL. Another 121,374 bcy of biota-risk soil and debris were disposed in Basin A.

8 The Toxic Storage Yards Soil project was completed in 2000. A total of 3,404 bcy of HHE soil, munitions debris and nonroutine odorous soils was excavated from 2 remedy sites and disposed in the HWL. Structural debris was disposed in Basin A.

8 The Residual Ecological Risk (RER) project (Part 1) was completed in 2006. A total of 804,348 bcy of RER soil was removed from 5 borrow areas and used as gradefill at depths of at least 2 feet below final grade. An additional 23 sites located outside of borrow areas also required remediation of biota-risk soils: 35,591 bcy of soil was excavated from 5 of the sites and placed at least 2 feet below final grade; 12 sites (including a portion of one site that also required excavation) required tilling with sampling verification that soil concentrations had been adequately reduced; and 9 sites were determined to be of acceptable risk based on sampling, existing data, or biomonitoring.

### Structures

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There were 217 structures identified in the Internal Parcel. Based on a structures survey during Remedial Investigation, 208 structures were identified in the ROD; an additional 9 structures were identified during remedial design. Of the 217 structures, 34 were determined to have no potential exposure and were needed for future use, so were not demolished.

Of the remaining 183 structures:

8 97 were removed as apart of the Miscellaneous RMA Structures Demolition and Removal Project (Phase 1 and II);

8 18 were removed as part of the Miscellaneous Northern Tier Soil, Miscellaneous Southern Tier Soil, and Toxic Storage Yards Soil Remediation Projects;

8 47 had been demolished prior to remediation; and

8 21 structures, currently in use as groundwater treatment facilities and supporting infrastructure, are retained for continued operations until each groundwater remedy has achieved cleanup goals. These structures will be demolished in the future as part of the groundwater remedy requirements.

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## Groundwater

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With the exception of a small area located in the northwest corner of Section 6, no groundwater contaminant plumes were identified in the Internal Parcel east of E street; therefore, the groundwater below this eastern portion of the Internal Parcel is included in the partial deletion.

Fifteen individual contaminant groundwater plumes were identified at RMA; these were consolidated into plume groups to facilitate treatment, which is ongoing through the operation of pump-and-treat facilities that will continue until contaminant concentrations are below remedial action levels. Five groundwater plume groups are present beneath the RMA west of E Street. Therefore, the groundwater below the Internal Parcel west of E Street is not included in this partial deletion and will remain on the RMA/NPL.

All of the on-post pump and treat systems are included in the Internal Parcel deletion but access will be retained by the Army for continued operation and maintenance.

Continuing groundwater remediation activities in the western portion of the Internal Parcel include:

8 The North and Northwest Boundary Containment Systems continue to treat groundwater and minimize migration of groundwater plumes offsite.

8 The Basin A Neck Containment System treats groundwater migrating from the Basin A, South Plants, and Section 36 Bedrock Ridge areas toward the northwest boundary.

8 The Rail Yard Containment System was built in 2001 prior to demolition of the Irondale System (ICS). This new system is located closer to the source and treats the Rail Yard groundwater plume, formerly treated by the Irondale System.

Completed groundwater remediation activities include:

8 The ICS became operational in 1981. The ICS extraction wells met the ROD shut-off criteria and the facility was demolished and removed in 2002.

8 The Motor Pool Extraction System was installed as an Interim Response Action. The Motor Pool extraction wells met shut-down criteria in 1998 and their operation was discontinued.

Continued monitoring of the groundwater aquifer, including that previously extracted/treated at the ICS and Motor Pool, is conducted as part of a sitewide monitoring program, as required by the ROD.

In addition to the continued operation of groundwater treatment systems, other remedies include:

8 In 1997, an ultraviolet-oxidation treatment system was put into operation at the North Boundary Containment System to treat the contaminant NDMA. The ultraviolet-oxidation treatment has effectively decreased NDMA concentrations in groundwater to below detectable levels.

8 A total of 51 wells - 27 of which were located in the Internal Parcel - that had the potential to provide a



Groundwater monitoring will continue as part of the Long-Term Monitoring Program

cross-contamination pathway from the contaminated, upper groundwater aquifer to the deeper, confined aquifer, were closed during the Confined Flow System Well Closure project completed in 2000.

8 Lake Level maintenance requirements are addressed through adherence to established management and institutional-control plans.

Use of the groundwater below RMA, including the Internal Parcel, and surface water for potable drinking purposes is prohibited by the FFA, the National Wildlife Refuge Act, and the ROD, and will continue to be prohibited even after the Internal Parcel is transferred to the USFWS.

The U.S. Army is responsible for ongoing monitoring, maintenance, and control of long-term groundwater monitoring wells located in the Internal Parcel.

## Long-Term Management Activities

### Long-Term Management

As required by the ROD, long-term management activities will continue in the Internal Parcel following deletion from the NPL.

Continuing activities include operation of groundwater treatment systems including the North Boundary and Northwest Boundary Containment Systems, the Motor Pool Extraction System, the Basin A Neck Containment System, and the Rail Yard Treatment System.

### Institutional Controls

Institutional controls, including restrictions on land use and access that are contained in the RMA National Wildlife Refuge Act of 1992 and the FFA, are incorporated as ROD requirements. These restrictions include:

8 prohibition of residential development, use of groundwater and surface water for potable water,

consumption of all fish and game, and agricultural activities;

8 preservation and management of wildlife habitats to protect endangered species, migratory birds, and bald eagles as required by applicable federal laws; and

8 restrictions on major alterations to the hydrogeologic characteristics of RMA.

Additional institutional controls are established in the Interim Institutional Control Plan for RMA. These include

8 restrictions on the construction or use of basements;

8 controlled access to remediation areas;

8 prevention of excavation into sites where contamination remains;

8 protection of engineered structures that are part of the remedy such as landfill covers, consolidation areas, and contamination

remaining in place;

8 maintenance of water levels in Lower Derby Lake to cover HHE sediment;

8 restricted access to the area surrounding the Basin F Wastepile during remediation;

8 protection of groundwater remedial action structures; and

8 maintenance of lake levels to support aquatic ecosystems.

### Five-Year Reviews

Five-Year Reviews will include the Internal Parcel areas. EPA will conduct the reviews every five years to ensure the remedy for RMA remains protective of human health and the environment and evaluate whether the remedy is functioning as designed and necessary operations and maintenance activities are being performed. The second Five-Year Review is currently being performed at the RMA.

## Basis for the proposed deletion

EPA bases its proposal to delete the Internal Parcel of the RMA Site on the determination by EPA, with the concurrence of the State of Colorado, that all appropriate actions under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) have been implemented.

Institutional controls limit access to areas within the Internal Parcel where hazardous substances remain above health-based levels

with respect to anticipated uses of and access to the RMA site. These uses are further limited under the FFA, the Refuge Act, and the ROD, and are discussed in the "Long-Term Management" section, above.

This partial deletion pertains only to the Internal Parcel of the On-Post OU of the RMA site. It does not include the rest of the On-Post OU, approximately 5.6 square miles, or the Off-Post OU, both of which will remain on the NPL.

### **Future Responsibility**

A partial deletion of a site from the NPL does not affect or impede EPA's ability or responsibility to conduct response activities for portions not deleted from the NPL. Additionally, partial deletion does not affect the liability of responsible parties or impede EPA efforts to recover costs associated with response efforts. The U.S. Army and Shell Oil Company remain responsible for all future remedial actions required at the Internal Parcel if future site conditions warrant such actions.

## RMA Site History

The RMA, located approximately eight miles northeast of downtown Denver, was established in 1942 by the U.S. Army to manufacture chemical warfare agents and incendiary munitions for use in World War II. Following the war and through the early 1980s, the facilities continued to be used by the U.S. Army. Beginning in 1946, some facilities were leased to private companies to manufacture industrial and agricultural chemicals. Shell Oil Company, the principal lessee, manufactured pesticides at the site from 1952 to 1982. Common industrial and waste disposal practices resulted in contamination of structures, soil, surface water, and groundwater. After 1982, the only activities at the Arsenal involved environmental cleanup.

In 1987, the RMA was listed on the NPL. A remedial investigation, endangerment assessment, and feasibility study, completed in



Weapons assembly at the RMA in the 1940s.

January 1995, provided information on the type and extent of contamination, potential human and ecological risks, and remedial actions for cleanup.

In June 1996, the U.S. Army, EPA, and the State of Colorado signed the ROD for the On-Post Operable Unit (OU), one of two operable units at RMA. The ROD specifies cleanup actions to be implemented for soil, structures, and groundwater for the On-Post OU of the RMA, which addresses contamination within the originally fenced 26.6 square miles of the RMA.

The Off-Post OU addresses contamination north and northwest of RMA.

In January 2003, the Western Tier Parcel, a 940-acre (approximately 1.5-square-mile) area of the On-Post OU, was determined to meet cleanup requirements, and was deleted from the RMA NPL site. In January 2004, the SPA and SDA, which together comprised 5,053 acres (approximately 7.9 square miles), were determined to meet cleanup requirements and were deleted from the RMA NPL site. The Internal Parcel comprises 7,399 acres (approximately 11.5 square miles).

Implementation of the remedy for the remaining 3,608 acres (approximately 5.6 square miles) is ongoing and is scheduled for completion in 2011. The Army will retain 1,000 acres that will not become refuge land and is not included in this deletion.

### ACRONYMS AND ABBREVIATIONS

bcy	Bank Cubic Yards
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
FFA	Federal Facility Agreement
HHE	Human Health Exceedance
HWL	Hazardous Waste Landfill
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OU	Operable Unit
PCB	Polychlorinated Biphenyls
RER	Residual Ecological Risk
RI	Remedial Investigation
RI/EA/FS	Remedial Investigation, Endangerment Assessment, and Feasibility Study
RMA	Rocky Mountain Arsenal
RMA/NPL Site	Rocky Mountain Arsenal/National Priorities List Site
ROD	Record of Decision
SDA	Surface Deletion Area
SPA	Select Perimeter Area
USFWS	U.S. Fish and Wildlife Service



## Public Meeting and Comments

Interested residents are invited to attend a public meeting on the RMA proposed deletion:

**Tuesday, May 9, 2006, 5:30-8:30 p.m.  
at the Doubletree Hotel, 3203 Quebec Street, Denver**

**Submit comments, identified by Docket ID Number EPA-HQ-SFUND-1987-0002, at:**

8 [www.regulations.gov](http://www.regulations.gov)

8 email: [chergo.jennifer@epa.gov](mailto:chergo.jennifer@epa.gov)

8 Fax: 303-312-6961

8 Mail: Ms. Jennifer Chergo  
Community Involvement Coordinator (8OC)  
U.S. EPA, Region 8, 999 18th Street, Suite 300  
Denver, CO 80202-2466

8 Hand Delivery: 999 18th Street, Suite 300  
Denver, CO 80202-2466, during business hours.

**For further information, call 303-312-6601 or visit:  
<http://www.epa.gov/region8/superfund/co/rkymtnarsenal>**

## Review the Documents

Comprehensive information on the RMA/NPL Site, as well as information specific to this proposed partial deletion are available for viewing at:

8 [www.regulations.gov](http://www.regulations.gov)

8 EPA's Region 8 Superfund Records Center, 999 18th Street, Suite 300, Denver, Colorado, by appointment, from 8:00 a.m. to 4:00 p.m., Monday through Friday, excluding holidays. Call (303) 312-6473.

8 The Joint Administrative Records Document Facility, Rocky Mountain Arsenal, Building 129, Room 2024, Commerce City, Colorado 80022-1748, from noon to 4:00 p.m., Monday through Friday, excluding holidays, or by appointment, (303) 289-0362.

**U.S. Environmental Protection Agency  
999 18th Street, Suite 300, 8OC  
Denver, CO 80202-2466**